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09/761,254	01/16/2001	Pierre Lelong	FR 000003	5188

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
P.O. BOX 3001  
BRIARCLIFF MANOR, NY 10510

EXAMINER

DASTOURI, MEHRDAD

ART UNIT PAPER NUMBER

2623

DATE MAILED: 03/12/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/761,254

Applicant(s)

LELONG ET AL.

Examiner

Mehrdad Dastouri

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicants' amendment filed January 6, 2004, has been entered and made of record.
2. Objection to Claims 6-11 has been withdrawn in view of Applicants' amendment.
3. Objection to the disclosure abstract has been withdrawn in view of Applicants' amendment.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aubin et al. (hereinafter Aubin), "Morphometric evaluations of personalized 3D reconstructions and geometric models of the human spine" in view of André et al. (hereinafter André), "Approach for the smoothing of three-dimensional reconstructions of the human spine using dual Kriging interpolation".

Regarding Claim 1, Aubin discloses an image processing method for providing three-dimensional geometric modeling of the spine, using a biplanar image reconstruction, comprising:

acquiring a first view of part of the spine (postero-anterior; Abstract; Section 2.2);

acquiring a second view (Lateral), of the same part of the spine taken from a different angle around the longitudinal axis of the spine (Lateral; Abstract; Section 2.2; Figure 3),

matching the dimensions of the views from two predetermined corresponding landmarks on each view (Figure 2; section 2.2); and

and deriving three-dimensional coordinates of Corresponding points along the spine (Pages 613-614; Sections 2.3 and 2.4)

Aubin does not explicitly disclose drawing an axial line on each acquired view of the spine.

André discloses for matching the two views, an axial line is drawn (Figures 4-6, and then iteratively, curve fitted to the landmarks points) and the two landmarks (marked TI-T12 or LI-L5) are set on said axial line on each view (Figures 4-6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the axial line drawn by André, which is then used to align the landmarks in each image, as a reference for the geometric transformations used by Aubin to minimize errors and to perform specific calculations to better interpolate differences in the image landmark data.

Aubin does not specifically disclose further limitation of providing a smoothed axial line. However, smoothing is a well known preprocessing function as disclosed by André.

André discloses performing a spline calculation (A function defined on an interval using to approximate a given function, and is composed of pieces of simple functions

defined on subintervals and joined at their endpoints with a suitable degree of smoothness; Dual Kriging smoothing interpolation method) for providing a smoothed axial line on each view (Abstract; Section 4), the spline calculation including mathematical modeling of drawn piece-wise linear curves on a respective one of the first and second views, previously set by a control means of a drawing program (Page 186, first Paragraph; and Section 1.2), for supplying respective new digital smoothed curves (Figures 4-6), the new digital smoothed curves being constructed with interpolated values provided between points of the respective piece-wise linear curves (Figures 2-6; Pages 187-188; Section 2), the new digital smoothed curves corresponding to a respective smoothed axial line in each view (Figures 4-6, esp. Figures 5a-5d; Section 3.2 and 4). The methodology disclosed by André will derive three-dimensional coordinates of corresponding points along the spine as a function of the smoothed axial lines (Figures 4-6; Sections 2-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Aubin's invention according to the teachings of André to smooth the axial lines in each view of the spine in accordance with the limitations recited above because it is a conventional preprocessing methodology routinely implemented in image processing for enhancement of the digital images. The smoothing process will ensure greater accuracy in the calculation of clinical parameters such as the Cobb angle (obtained from the inflection points of the smoothed 3-D curve passing through the vertebral centroids (André; Section 4, Conclusions).

As per Claim 2, André teaches:

wherein, for matching the two views, an axial line is drawn (Figures 4-6, and then iteratively, curve fitted to the landmarks points) and the two landmarks (marked TI-T12 or LI-L5) are set on said axial line on each view (Figures 4-6).

As per Claim 3, Aubin teaches:

wherein matching of the dimensions of the two views is performed by a calculating matching coordinates for the two corresponding landmarks (Page 613, Column 1, 2<sup>nd</sup> Paragraph beginning, "The coordinates...").

As per claim 4, Aubin teaches:

wherein a common system of coordinates is determined for the two views from the matched coordinates of the two corresponding landmarks (Page. 613, Column 1, Paragraph 3).

As per Claim 6, André teaches:

wherein three dimensional coordinates of corresponding points along the spine are determined for points regularly spaced along the axis of coordinates corresponding to the longitudinal axis of the spine (Figures 4-6, Points on Lateral (Z-Y) and coronal (X-Z)).

As per Claim 7, André teaches:

wherein the common system of coordinates is an orthogonal system, the first view is a frontal view, the second view is a lateral view orthogonal to the frontal view, with a common axis in the direction of the longitudinal axis of the spine, a second axis

parallel to the frontal plane of view and the third axis parallel to the lateral plane of view (Figure 4, Frontal, Lateral and Coronal views, Z, X and Y axes).

6. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aubin et al. (hereinafter Aubin), "Morphometric evaluations of personalized 3D reconstructions and geometric models of the human spine" further in view of André et al., (hereinafter André), "Approach for the smoothing of three-dimensional reconstructions of the human spine using dual Kriging interpolation" and Steiger et al. (U.S. 5,483,960), hereinafter Steiger.

As per Claim 8, André teaches:

the computer program for allowing efficient use of dual Kriging smoothing interpolation according to the methodology recited in Claim 1 (Abstract and Sections 2-4). The computer program disclosed by André will be inherently included in a computer system. Although the display means recited in the claim is not explicitly disclosed by Aubin or André, the computer systems conventionally include display means for displaying the result of executed programs as disclosed by Steiger (Figures 12 and 15, also displayed images of different vies of spine as depicted in Figures 1A, 1B, 3A, 3B, etc.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Aubin's and André combination according to the teachings of Steiger to display different spine views because it is a conventional procedure routinely implemented in the art.

Regarding Claims 10 and 11, arguments analogous to those presented for Claims 8 and 9 are applicable to Claims 10 and 11.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**MEHRDAD DASTOURI**  
**PRIMARY EXAMINER**

*Mehrdad Dastouri*

Mehrdad Dastouri  
Primary Examiner  
Art Unit 2623  
March 10, 2004